nel 2 showed a 160 percent increase, Channel 3 showed a remarkable 860 percent increase, and Channel 4 increased by 214 percent. The large increase seen on Channel 3 is due to its small baseline amplitude. This shows one very important point: If a REBAM probe is mounted directly opposite the center of the radial load zone in a bearing under pure radial loading, you may not see a large signal when the bearing is healthy or new, but when the bearing fails, it will likely produce enough deflection in the outer ring to produce a large change in signal amplitude. Much of the change occurred at the outer race element pass frequency, but we also see a large change in the components in the rotor frequency region, particularly the 2X and 3X components.

Conclusion

This testing under radial loading has allowed us to draw some important conclusions about the operation and performance of the REBAM® system:

1. REBAM® probes which are mounted away from an outer race spall will likely show evidence of bearing damage when the spalling progresses to the inner race or elements.
2. The REBAM® system is best utilized as an indicator of when a bearing needs to be replaced. A seismic transducer (casing mounted accelerometer) may give earlier warning of bearing wear but may also cause the user to replace the bearing before its economic life is over.
3. The REBAM® system gives a much clearer picture of what is occurring in a particular bearing than a seismic transducer.
4. A REBAM® probe which is mounted in the least optimum angular position (180 degrees from the radial load zone center) is still likely to give very good evidence of spalling in the bearing.

In the next issue of *Orbit* we will present the data and conclusions from the axial loading failure testing and low axial load testing. ■

S.O.S.

Synopsis Of Saves

The following actual incidents briefly illustrate some of the benefits customers have received using Bently Nevada products in a variety of applications:

An ethylene plant had a problem with the third stage compressor on one of their units. Due to the process, the third stage runs hot and causes a carbon buildup on the turbine blades. Using Dynamic Data Manager®, rotating specialists and operations personnel can monitor amplitude and phase of the third stage bearings on the unit. It allows them to efficiently schedule a compressor wash to remove the carbon buildup.

Through an on-line look at trends from their System 64, a utility customer detected a thrust wear problem on a boiler feed pump. Accelerated wear was only evident after viewing a one-year trend. The discovery allowed investigation of a potential problem that, otherwise, would have been overlooked.

Trendmaster® 2000 allowed a utility company to identify two cooling tower fan gearboxes in need of rework prior to returning them to service. The customer believes this finding saved more than enough to cover the entire cost of the system.

Our Machinery Diagnostic Services group worked with a refining customer to solve structural/rotor resonance problems on a fan. 1X (synchronous) vibration plots from ADRE®3 were used to identify the problem. The client was then able to rectify the situation.

Another utility company effectively used their ADRE® 3 System to successfully diagnose a turbine problem. As the turbine approached half running speed, vibration levels dramatically increased. After analysing the data, it was decided the best alternative was to shut the machine down for inspection. The problem was believed to be a bow in the shaft.

When four turbine bearings had high temperatures, Dynamic Data Manager® DC Gap trend data confirmed the prognosis of wiped bearings. It also indicated that not as many bearings were wiped as originally thought. The utility company saved disassembly time and effort.

Following a motor coupling failure on a compressor machine train, a refining customer was able to determine the cause using a TorXimitor®. It was found that a torsional resonance had been excited, producing high enough torque to induce fatigue failure in the coupling. The increase in torque only occurred within a narrow speed range. The anti-surge control is being redesigned so the unit does not operate within this range.

A 3300 System installed in December 1991 on a scrubber fan provided a high frequency blade pass alarm when the process fouled the fan. The customer experienced a similar problem earlier in the year on the same machine which caused the machine to come apart.

A recently-installed Transient Data Manager™ System at a utility has already proven its value. Following a forced trip, the customer was able to do a balance-correction in one day on a 625 MW unit. This saved at least two days of outage (and associated lost revenue). ■